

IN THE CLAIMS:

Please cancel Claims 17-21 without prejudice to or disclaimer of the subject matter contained therein.

Please amend Claims 1-3, 6-10, 13-16, 22, and 23 and add new Claims 24-26 as follows.

1. (Currently Amended) A speech signal processing apparatus comprising:  
~~speech segment search means for searching a speech database for speech segments that satisfy a phonetic environment;~~

HMM learning means for computing HMMs of ~~phonemes on the basis of a search result of said speech segment search means~~ speech segments with phonetic label in a speech database;

segment recognition means for performing segment recognition of the speech segments in the speech database on the basis of the HMMs ~~of the phonemes;~~ and

registration ~~segment~~ means for ~~determining a speech segment used in the computation of the HMMs by said HMM learning means and registering the a~~ speech segment in a segment dictionary, in a case where the recognition result of the speech segment by said segment recognition means corresponds to the phonetic label of the speech segment in  
~~accordance with a segment recognition result of said segment recognition means.~~

2. (Currently Amended) The apparatus according to claim 1, wherein the phonetic label is a diphone label, and said segment recognition means ~~adopts diphones as units of~~

~~the phonemes~~, categorizes speech segments into four categories CC, CV, VC, and VV (C: a consonant, V: a vowel), and performs segment recognition in each category.

3. (Currently Amended) The apparatus according to claim 1, wherein said registration ~~segment~~ means comprises:

pattern storage means which registers has allowable ~~speech segment~~ phonetic label patterns, and

said registration ~~segment~~ means checks if a phonetic label of a speech segment ~~pattern~~ matches with one of the allowable phonetic label patterns even if the phonetic label is not equal to the recognition result of said segment recognition means ~~a speech segment that is not successfully recognized by said segment recognition means~~, and registers the speech segment in the segment dictionary if the ~~corresponding speech segment pattern~~ is found.

4. (Previously Presented) A speech signal processing apparatus comprising:  
speech segment search means for searching a speech database for speech segments that satisfy a phonetic environment;

HMM learning means for computing HMMs of phonemes on the basis of a search result of said speech segment search means;

segment recognition means for performing segment recognition of the speech segments on the basis of the HMMs of the phonemes; and

registration segment means for determining and registering a speech segment in a segment dictionary when the number of speech segments recognized by said segment recognition means is not less than a predetermined value.

5. (Previously Presented) The apparatus according to claim 4, wherein said registration segment means registers a speech segment in the segment dictionary if at least a vowel part of the speech segment is correctly recognized, even when the number of speech segments recognized by said segment recognition means is not more than a predetermined value.

6. (Currently Amended) The apparatus according to claim 1, wherein said segment recognition means computes likelihoods of speech segments of an identical ~~phoneme~~ phonetic label, and

said registration ~~segment~~ means registers, in the segment dictionary, speech segments having maximum likelihoods or having likelihoods not less than a predetermined value.

7. (Currently Amended) The apparatus according to claim 6, wherein said registration ~~segment~~ means registers, in the segment dictionary, speech segments having upper values obtained by normalizing the likelihoods by durations of the speech segments or likelihoods having the values not less than a predetermined value.

8. (Currently Amended) A speech signal processing method comprising:

~~a speech segment search step of searching a speech database for speech segments that satisfy a phonetic environment;~~

~~an HMM learning step of computing HMMs of phonemes on the basis of a search result in said speech segment search step~~ speech segments with phonetic label in a speech database;

~~a segment recognition step of performing segment recognition of the speech segments in the speech database on the basis of the HMMs of the phonemes; and~~

~~a registration segment step of determining a speech segment used in the computation of the HMMs in said HMM learning step and registering the a speech segment in a segment dictionary, in a case where the recognition result of the speech segment in said segment recognition step corresponds to the phonetic label of the speech segment in accordance with a segment recognition result in said segment recognition step.~~

9. (Currently Amended) The method according to claim 8, wherein the phonetic label is a diphone label, and said segment recognition step ~~adopts diphones as units of the phonemes and~~ categorizes speech segments into four categories CC, CV, VC, and VV (C: a consonant, V: a vowel), and includes the step of performing segment recognition in each category.

10. (Currently Amended) The method according to claim 8, wherein said registration ~~segment~~ step comprises:

a pattern storage step of registering allowable ~~speech segment~~ phonetic label patterns, and

a said registration ~~segment~~ step includes a step of checking if a ~~speech segment~~ pattern matches a ~~speech segment~~ that is not successfully recognized in said segment recognition step, and registering the ~~speech segment~~ in the segment dictionary if the corresponding ~~speech segment pattern is found~~ whether the phonetic label of a speech segment matches with one of the allowable phonetic label patterns even if the phonetic label is not equal to the result in said segment recognition step.

11. (Previously Presented) A speech signal processing method comprising:  
a speech segment search step of searching a speech database for speech segments that satisfy a phonetic environment;

an HMM learning step of computing HMMs of phonemes on the basis of a search result in said speech segment search step;

a segment recognition step of performing segment recognition of the speech segments on the basis of the HMMs of the phonemes; and

a registration segment step of determining and registering a speech segment in a segment dictionary when the number of speech segments recognized in said segment recognition step is not less than a predetermined value.

12. (Previously Presented) The method according to claim 11, wherein said registration segment step includes a step of registering a speech segment in the segment

dictionary if at least a vowel part of the speech segment is correctly recognized, even when the number of speech segments recognized in said segment recognition step is not more than a predetermined value.

13. (Currently Amended) The method according to claim 8, wherein ~~the~~ said segment recognition step includes a step of computing likelihoods of speech segments of an identical ~~phoneme~~ phonetic label, and

said registration ~~segment~~ step includes a step of registering, in the segment dictionary, speech segments having maximum likelihoods or having likelihoods not less than a predetermined value.

14. (Currently Amended) The method according to claim 13, wherein said registration ~~segment~~ step includes a step of registering, in the segment dictionary, speech segments having upper values obtained by normalizing the likelihoods by durations of the speech segments or likelihoods having the values not less than a predetermined value.

15. (Currently Amended) A computer readable storage medium storing a program for implementing the method ~~recited in~~ according to claim 8.

16. (Currently Amended) A speech ~~signal processing~~ synthesis apparatus comprising:

speech synthesis means for synthesizing speech using the segment dictionary made by the speech signal processing apparatus according to claim 1.

~~a segment dictionary in which speech segments are registered by the method recited in claim 8;~~

~~language analysis means for performing language analysis of input text data;~~

~~prosody generation means for generating prosody on the basis of an analysis result of said language analysis means;~~

~~speech segment selection means for searching said segment dictionary on the basis of the prosody generated by said prosody generation means to select corresponding speech segments;~~

~~speech segment modification/concatenation means for modifying and concatenating the speech segments selected by said speech segment selection means; and~~

~~speech reproduction means of reproducing speech on the basis of the result modified by said speech segment modification/concatenation means.~~

17-21. (Cancelled)

22. (Currently Amended) A speech synthesis method comprising:

a speech synthesis step of synthesizing speech using the segment dictionary made by the speech signal processing method according to claim 8. ~~The method according to claim 20, further comprising a speech synthesis step of producing synthetic speech using the segment dictionary.~~

23. (Currently Amended) A computer readable program storing a program for implementing the method ~~recited in claim 20~~ according to claim 22.

24. (New) A speech signal processing apparatus comprising:

HMM learning means for computing HMMs of speech segments with phonetic label in a speech database;

segment recognition means for performing segment recognition of the speech segments in the speech database on the basis of the HMMs;

judgment means for judging whether the result of the segment recognition corresponds to the phonetic label of a speech segment; and

storage means for storing the result of the judgment judged by said judgment means associated with the speech segment.

25. (New) A speech signal processing method comprising:

an HMM learning step of computing HMMs of speech segments with phonetic label in a speech database;

a segment recognition step of performing segment recognition of the speech segments in the speech database on the basis of the HMMs;

a judgment step of judging whether the result of the segment recognition corresponds to the phonetic label of a speech segment; and

a storage step of storing the result of the judgment judged in said judgment step associated with the speech segment.



26. (New) A computer readable program storing a program for implementing the method according to claim 25.